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A CONCEPTUAL FRAMEWORK WAS PROPOSED FOR AN EDUCATIONAL PSYCHOLOGY COURSE IN THE GENERAL METHODOLOGY OF TEACHING. THIS COURSE WOULD TRANSCEND THE SPECIAL REQUIREMENTS OF ANY GIVEN SUBJECT MATTER OR GRADE LEVEL AND SERVE AS THE BASIS FOR DERIVING THE SPECIAL METHODS OF TEACHING THAT WOULD APPLY TO ANY PARTICULAR GRADE LEVEL OR SUBJECT MATTER. UNDERLYING THE DISCUSSION WAS THE PROPOSITION THAT DIFFERENT BEHAVIORS ARE LEARNED BY DIFFERENT BASIC PROCESSES, AND THE CORRESPONDING CONCEPTIONS OF TEACHING MUST DIFFER ACCORDINGLY. THE AUTHOR PROPOSES THAT TEACHING SHOULD BE VIEWED AS THE EXERTION OF PSYCHOLOGICAL FORCE. HE ALSO ARGUED THAT THE MAJOR LEARNING THEORIES DESCRIBE THREE KINDS OF FORCE A TEACHER CAN EXERT, THAT IS, TEACHING CAN BE DONE BY (1) CONDITIONING THE LEARNER, (2) PROVIDING MODELS TO BE IMITATED BY THE LEARNER, AND (3) BY CHANGING THE COGNITIVE STRUCTURE OF THE LEARNER. THE CONCEPT OF TEACHING FORCE WAS THEN APPLIED TO THE FORMULATION OF WARMTH AND COGNITIVE VALIDITY AS DESIRABLE CHARACTERISTICS OF TEACHERS. IT WAS CONCLUDED THAT THE DEMANDS OF COGNITIVE VALIDITY AND INDIVIDUAL DIFFERENCES CAN BE MET BY PROGRAMED INSTRUCTION FOR CERTAIN TYPES OF TEACHING-LEARNING SITUATIONS. THIS LECTURE WAS PRESENTED IN THE SERIES ARRANGED TO COMMEMORATE THE DIAMOND JUBILEE YEAR OF THE SCHOOL OF EDUCATION AT NEW YORK UNIVERSITY (FEBRUARY 14, 1966). (GD)

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Psychological Conceptions of Teaching*

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For anyone aware of the tides now running in American education, these are indeed exciting times. Today, as never before, the educational world is hungry for ideas. The federal government has appropriated billions to support progress in education. We are not only being driven toward improvement by the urgent problems that beset us; we are also being attracted by unprecedented material support for the tryout of fresh conceptions.

The New Valuation of Educational Ideas

During the past decade, federal support of educational research has been achieving higher levels every year. The trend has now reached a new crest with the enactment of legislation establishing an altogether novel kind of institution in American education -- the regional laboratory. The regional laboratories will be added onto the already functioning programs of research and development centers and cooperative research projects. They will be joined to a ready-made market for their products in the form of the supplementary educational centers. The new laboratories, none of them beyond the planning stage

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today, will have millions in annual support for multifaceted attacks on the whole array of educational problems, both national and regional.

It seems safe to say that the nation's support for educational research, development, demonstration, and dissemination has begun to approach the level that thoughtful students of our needs and potentials have long been asking for, have hardly dared to hope for, and are now leaping to take advantage of. For years, educational research workers have been asking for more tools with which to do their job -- tools in the form of dollars, trained men, and organizations. We now bid fair to have such tools in adequate supply.

The Need for New Conceptions of Teaching

Today I wish to talk about another essential kind of tool -- the conceptions of teaching that will inevitably lie close to the heart of all this research and development effort. These conceptions will determine what gets done just as much as will the men, the buildings, the computers, the research designs, and the methods of development and dissemination. Our conceptions of teaching will give direction to our choices of the kinds of variables that we study, measure, and manipulate.

For the behavior of teachers is one of the major avenues through which a society can influence what its children learn. Apart from the curriculum materials, the physical facilities, and the administration of the schools, it is through teachers that a society implements its interest in having students learn certain things.

Concern with Teaching in Educational Psychology

Although this kind of stress on teaching may seem banal to anyone outside educational psychology, within that field it has not been adequately honored. The

educational psychologist has not been giving prospective teachers enough of the kind of training they need. Most of the first course in educational psychology is concerned primarily with the characteristics of learning and the learner, with the learner's adjustment, with the learner's growth and development, and with measurement and evaluation of the learner. It is not sufficiently focused on methods of teaching or how teachers should behave. And yet, since it is largely through the process of teaching that our theories and principles of learning can be put to use, it is conceptions, theories, and methods of teaching that educational psychologists should develop. Then the educational psychology course could help more with the problems of teaching.

This is not to say that a prior concern with learning is misplaced. It is to say that we should not stop with learning, but go on from there to develop what such knowledge means for how teachers should behave. The course in educational psychology ought, in its essentials, to be a course in the general methodology of teaching, general in the sense of transcending the special requirements of any given subject matter or grade level. This general methodology would then serve as the basis for deriving the special methods of teaching that would apply to any particular grade level or subject matter.

Can Teaching be Autonomous?

Let us now consider briefly a somewhat more extreme position than the one I am advocating. This is the position that teaching should be regarded as an autonomous, self-determined process coordinate with learning. This point of view would erect the study of teaching as a discipline in its own right, independent of the study of learning, just as learning can be studied independently of teaching. In this view, the teaching process would be regarded as the given, and the learning process would become something to be adapted to the

teaching process. Thus, we would formulate the theory of teaching, -- of how teaching does go on -- and then we would determine what such theory means for the learning process, for how learning should go on. In short, we would describe what teachers do and then see if we can derive from that description a formulation of what the learner should do.

The trouble with this idea -- the idea of making teaching the autonomous process with learning the adaptive one -- is that our schools, after all, have learning as their objective, with teaching only a means to that end. We cannot let teaching go on in whatever way seems to be convenient or necessary and then require learners to adapt to the kind of teaching they are provided with. Instead, if teaching procedures and learning procedures are not well suited to each other, then it is teaching that will have to change so that it brings about the kind of learning that the school is intended to produce.

Interdependence of Teaching and Learning

But even as we reject this notion of making teaching an autonomous discipline, we must perceive that, if teaching is not to have hegemony, neither must learning. The two processes must indeed be adapted to one another so as to make whatever combination of procedures pays off best. We need not consider learning to be an immutable, fixed, given process to which teaching must be adapted. Instead we should conceive of a teaching-learning process, both of whose parts can be changed to make learning more effective.

So we come to the position that any valid conception of teaching must be integrally related to a conception of learning. How human beings learn should provide much of the basis for our derivations of how teachers should teach. In the past, treatments of human learning have not often been followed through to the point of making such derivations. The analysis of the learning process has

too often been the end of the matter, and not enough effort has been made to spell out what the learning process implies for the method of teaching. It is such implications for teaching that may be derived from various conceptions of learning that I now wish to consider.

Types of Learning Task and Process

One basic proposition that I want to offer at the outset is that learning does not go on in the same way for all behaviors learned. Some things are learned by one process, and some by another. Some fallacies die hard, and the notion of a single general theory of learning to account for all the kinds of learning that human beings can manifest seems to have more viability than most. We can still hear today the claims of the contiguity theorists, the reinforcement theorists, the identification theorists, and the cognitive theorists that each of them has the formulation that is adequate to account for all the learning that takes place, in all species, and certainly in the human species.

But the idea has certainly had its critics. In 1942, Lewin asked, "Have we any right to classify the learning to high-jump, to get along without alcohol, and to be friendly with other people under the same term, and to expect identical laws to hold for any of these processes?" (1942, p. 220). Lewin distinguished at least four types of changes within what is called learning: changes in cognitive structure, motivation, group belongingness or ideology, and voluntary control of the body musculature. In 1949, Tolman suggested that "our familiar theoretical disputes about learning may <u>perhaps</u> ... be resolved, if we can agree that there are really a number of different kinds of learning .... The theory and laws appropriate to one kind may well be different from those appropriate to other kinds" (1949, p. 144). Tolman

tentatively offered six types of learning, which he called cathexes, equivalence beliefs, field expectancies, field-cognition modes, drive discriminations, and motor patterns; for each of these he saw the possibility of a different theory of learning.

In the volume entitled Categories of Human Learning, edited by Arthur Melton (1964), we find six categories that were "chosen because they seem to represent the categories most commonly employed by investigators in thinking about and doing research on human learning, and have become for this reason part of the tradition of descriptive language of the science of human learning" (Melton, 1964, p. viii). The categories were conditioning, rote learning, probability learning, skill learning, concept learning, and problem solving. But even these were regarded by Melton as having little usefulness in the scientific analysis of learning; he regarded as more useful the rather large and steadily increasing set of "subcategories of these primitive major categories" (p. 338), whose dissimilarities in terms of process and phenomena were "much more striking than the similarities" (p. 338).

A further attempt at the delineation of types of learning was offered in 1965 by Gagné (1965); he proposed eight kinds in the following order of increasing complexity: signal learning, stimulus-response learning, chaining, verbal-association learning, multiple discrimination learning, concept learning, principle learning, and problem solving. The basic distinction between one of these forms of learning and another, according to Gagné, lies in its prerequisites, or what the individual must previously have learned. He considers each of his types of learning to depend on certain outcomes from types earlier in his hierarchy.

Thus far, I have urged that teaching be made a central concern in educational psychology, that teaching and learning processes are interdependent, and

that a pluralistic view of the learning process must be adopted. Now I should like to offer a general conception of teaching, to examine some special conceptions of teaching that follow from the general one, and to consider some of the implications of such conceptions of teaching for research and practice.

Teaching as the Exertion of Psychological Force

First, I propose that we conceive of teaching in general as the exertion of psychological force. Everyone agrees that learning should be defined as a change in capabilities or ways of behaving that may be attributed to experience. The experience must, however, be psychological in character rather than physiological or mechanical. That is, we rule out changes in behavior due to drugs, fatigue, disease, or sensory adaptation, and we also rule out the effects of being mechanically pushed or pulled by something. Psychological experience is hard to define, but surely it includes the effects of stimuli that get into us via sensation and perception and act upon the central nervous system in some way. Without going into these matters, let us merely characterize learning as a fairly stable change in behavior due to psychological rather than other kinds of forces.

Three Kinds of Teaching Force

How these forces operate to produce learning is one problem to which theories of learning are offered as solutions. Theories of learning or families of such theories, fall into three broad categories: conditioning theories, imitation theories, and cognitive theories. Let us accept these conceptions of the learning process as having some value for the organization of our ideas about learning. When we do so, it becomes possible to regard conceptions of

teaching as dealing with the kinds of force that bring about learning. Hence, these are the kinds of force that teachers can exert. Thus, we can speak of teaching by conditioning the learner, teaching by modeling imitation on the part of the learner, and teaching by changing the cognitive structure of the learner.

Conditioning Force

Teaching by conditioning consists in arranging stimuli so as to bring forth desired responses and then providing a reinforcement as quickly as possible. For example, we want a child to volunteer more often in class, and when he finally does make the desired response, we call on him and praise him as quickly as possible, so that this desired response will be more likely to occur the next time he is in this situation. For certain kinds of behavior, the idea of teaching by exertion of conditioning force makes eminently good sense. Just what kinds of behavior these are, is not yet altogether clear, but it may well be that affectively-toned behaviors, much involved with fears and hopes, and not much bound up with any logic, lend themselves well to being viewed as behaviors to be taught by conditioning.

Modeling Force

Teaching by modeling consists in the teacher's behaving in ways that he wants the learner to acquire through imitation. As Bandura and Walters (1963) have formulated it, such exposure to a model can have three kinds of effects: (1) a modeling effect, whereby the learner acquires new kinds of response patterns, (2) an inhibitory or disinhibitory effect, whereby the learner decreases or increases the frequency, latency, or intensity of previously acquired responses, and (3) an eliciting effect, whereby the learner receives from the model merely a

cue for releasing a response that is neither new nor inhibited. The modeling effect occurs when a teacher shows a pupil how to hold a pencil or write a capital "Q," and thus inculcates a new behavior. The inhibiting or disinhibiting effect occurs when he lets the pupil know, through modeling, that it is or is not permissible to look at pictures of nudes in an art book, and thus inhibits or disinhibits an old response. The eliciting effect occurs when, through modeling, he teaches a pupil to rise when a lady enters the room and thus provides a cue eliciting a response neither new nor inhibited.

It should be noted that I have chosen, as my examples of things learned by imitation, behaviors that have no intrinsic logic or rationale. The situations or stimuli calling forth these behaviors have no structure that makes one kind of response more logical or "true" than another. Learning through imitation seems to be especially appropriate for tasks that have little cognitive structure.

Cognitive Force

Teaching by changing cognitive structure consists in arranging for the student to understand facts, concepts, and principles in such relationships that the desired kinds of learning will result. If we want a student to understand a strange phenomenon, we can force him to understand it by showing him how it is merely an instance of a general principle. We can force someone to understand why mercury rises in a thermometer when the temperature goes up, by referring to the more general principle that heat causes metals to expand. We can compel someone to understand why water doesn't fall out of a can when we swing the can around vertically, by showing that this phenomenon is an instance of centrifugal force. In doing so, we can exert perceptual and cognitive forces such as those of figure and ground, similarity and contrast, grouping, emphasis, analogy,

context, and logic. Properly used, these forces will make the student see the cues to a concept, a principle, or the solution to a problem. These forces operate to bring about the change in cognitive structure that many kinds of learning consist in.

The distinguishing mark of learnings that can be produced by the use of cognitive forces is that they possess a cognitive structure. The tighter the logical or perceptual ties that hold a body of ideas or behaviors together, the better we can teach in this way. It makes little sense to employ conditioning or modeling forces to teach the multiplication table, for example, when the cognitive forces in those tables are so strong.

An Ambiguous Case: Teaching Forces in Fostering Creativity

Sometimes it is not easy to distinguish the kinds of forces that ought to be employed to bring about a given kind of learning. My examples have thus far been as pure as I could make them, in order to show as convincingly as possible the ways in which different kinds of teaching force make better sense for different kinds of things to be learned.

But what about such an outcome as "creativity?" This is a relatively new concern in education, and conceptions of what it consists in are understandably not as well formulated as those that call for convergent thinking. Perhaps this is why it is possible to find the teaching of creativity characterized by one writer as a matter of conditioning, by another as modeling, and by a third as cognitive restructuring. One of my students, Rosemary Allen (1965), recently furnished me with the following quotations, from various writings on methods of training for originality or creativity:

First, a believer in modeling theory speaks as follows: "It is, of course, necessary that the teacher himself be original, flexible, and enthusiastic and that, in his teaching, he emphasize experimentation and discovery rather than routine" (Mouly, 1960, p. 338). Another writer takes a similar position: "If the students perceived the instructor as a model worthy of identification or imitation, a superordinated person ... who held creative behavior as an important value -- it could be learned, creative behavior was good -- then they, too, could relax and become confident participants in the creative process ..." (Brown, 1965, p. 53).

Another writer, however, seems to be invoking conditioning theory: "Creativity ... is a way of life that involves constant error; hence it is interesting to study how a human being learns error as a way of life. Since reward is, even in human beings, a fundamental way of establishing learning, a reasonable hypothesis is that anyone who follows error as a way of life, must have had his errors reinforced by rewards, until error as a response was firmly established, while at the same time his correct responses were few in number or not as strongly reinforced as the incorrect" (Henry, 1957, p. 152).

Finally, a cognitive theorist writes as follows: "When we think creatively, we shake ourselves loose from our old assumptions, we see old instruments as capable of new functions -- the rigid structure of the field has been broken down so as to permit new configurations. From this point of view, it is obvious that wherever restructuring takes place there is the possibility of creative thinking" (MacLeod, 1962, p. 188).

My student concluded from these statements that "all three of the theories of teaching could be utilized in the training of creative individuals" (Allen, 1965, p. 11). I am inclined to agree, except that I should add that each of the

different theories, or kinds of teaching force, seems to apply better to a different aspect of the teaching task. That is, the teacher's over-all role is a complex one and has many facets. Some aspects of the teacher's role can be understood best in terms of one kind of teaching force, and some, in terms of another.

The Concept of Teaching Force and Teacher Characteristics

The view that teaching is the exertion of a force clarifies these aspects. It throws light on some of the variables that have impressed research workers with their validity as characteristics of effective teachers. To make clear how this kind of clarification may be gained, I should like to deal with two characteristics of teachers: warmth and cognitive validity. Each of these is, of course, merely a label for something quite complex. For each of these characteristics, I shall first give an operational definition, then an example of the evidence that it is desirable, and finally a rationale as to how the characteristic follows from one or another of the conceptions of teaching.

Warmth

Warmth refers to the degree to which the teacher tends to be approving, to provide emotional support, to express sympathetic attitudes, to accept pupils' feelings, and so on. It has been studied more, perhaps, than any other characteristic of teachers. It can be measured with the Categories for Interaction Analysis developed by Flanders (1960), with the Minnesota Teacher Attitude Inventory (Cook, Leeds, and Callis, 1951), with the California F Scale (McGee, 1955), and with parts of the Teacher Characteristics Schedule developed by Ryans (1960).

Measures of warmth quite consistently correlate positively with the evaluations of teachers by pupils, principals, and observers. Especially at the elementary school level, warmth seems to be important to many pupils, and it correlates with how well pupils like their teacher. Sometimes teacher warmth is related to pupil productivity (Cogan, 1958), to achievement in subjects like mathematics and social studies (Flanders, 1960), or to creativity (Sears and Hilgard, 1964, p. 209).

Warmth may be understood in relation to conditioning theory as the teachers' over-all tendency to emit positive reinforcements. Hence, pupils who have warm teachers are less inhibited about making responses, because whatever they do is more likely to be met with positively reinforcing behavior on the part of the teacher.

In another sense, however, the value of teacher warmth may be understood in terms of Heider's theory of cognitive balance (Heider, 1958), which predicts that we will tend to like someone whom we perceive as liking us. Warm teachers are perceived by pupils as liking them, and the pupils tend to reciprocate the affection. Heiderian theory also predicts that pupils who regard a teacher favorably, with high esteem, will tend to adopt that teacher's attitudes and orientations toward the objects and ideas in the environment. So we have a rationale for the importance of warmth in terms of modeling theory. Heiderian theory also predicts that pupils who perceive a teacher as liking them and liking their fellow pupils will tend themselves to like their fellow pupils; this is exactly what Sears found, namely that "teachers who like pupils tend to have pupils who like each other" (Sears and Hilgard, 1964, p. 206).

Cognitive Validity

By cognitive validity I mean the degree to which the teacher possesses, and reflects in his behavior, a valid, systematic cognitive structure of the concepts and principles of the discipline he is trying to teach. Here is where we would ordinarily put the teacher's "knowledge of his subject," except that the latter term does not signify well enough the organization and sequence of ideas, at the concrete as well as the abstract levels, with which we are here concerned.

In recent years, some new ideas about cognitive validity and subject matter structure have been developed by students of programed instruction and technical training. Gagné and his co-workers (Gagné, 1965, pp. 172-204) have provided illustrations of how a task performance set up as a goal can be analyzed into prerequisite sub-tasks, ordered in successive steps that are true both to the logic of the subject and to the way in which it can be learned. Such planned sequence of instruction militates against skipping essential steps in the development of understanding of a problem, a principle, or concept. This kind of meticulous analysis of what, cognitively speaking, amounts to walking before one runs -- and to crawling before one walks -- in any given content has often been done intuitively and artistically by skillful teachers. We are now beginning to have some principles to guide this kind of subject matter analysis and sequencing into learning structures.

The importance of cognitive validity, and of all that I am trying to connote with that term, is that the teacher must understand what he is to teach. B. O. Smith (1964) has called our attention to the miserable logic that can too often be found in classroom discussions of the definition of a concept, say "imperialism," or of the explanation of an event or a state of affairs, say "the

Boxer Rebellion." Smith and his co-workers find that such logical operations are poorly carried out by teachers and students. These research workers are proceeding on the hypothesis -- which is altogether consistent with a conception of teaching as the exertion of cognitive force -- that "the quality of teaching will improve if the performance of the logical operations involved is improved" (Smith, 1964, p. 6).

The same kind of conception of teaching seems to imbue the work of Hilda Taba (1964), who has been formulating teaching strategies aimed at developing the ability of pupils to form concepts, make inferences, induce generalizations, and explain phenomena. Her explorations and analyses have led her to imply some rather severe demands on the teacher. For example, she states that:

"Prolonged assimilation of facts without a corresponding reshaping of the conceptual schemes with which to organize them is bound to retard the maturation of thought. On the other hand, a premature leap into a more complex or a higher level of thought is likely to immobilize mental activity and cause reversion to ... a lower level of thought . .. An appropriate transition from one [level of thought] to the other demands a proper match between the current level and that which is required. Determining the proper match is one of the most difficult tasks in teaching ... " (Taba, 1964, p. 528).

Thus Taba's teacher is required to make quick and subtle judgments about the cognitive processes of her pupils, about when the discussion has gotten to the point that an attempt at generalization is called for. But that is not the teacher's only burden; she also has the problem of individual differences. Even if she possesses the teaching strategies for implementing the principles of sequence, some of her pupils need more concrete instances than do others before they are ready for the leap to formal or abstract thought. Indeed, as Taba says, "It is not beyond possibility that by far the most important individual differences

may be found in the amount of concrete thinking an individual needs before formal thought can emerge" (Taba, 1964, p. 528).

The Demands of Cognitive Validity and Individual Differences

So our concern with cognitive processes and the cognitive validity of the teacher can lead us into what looks like an impasse. The task of teaching begins to seem too hard, if not impossible. I am not the first student of teaching to find himself facing this problem, even if my path may have been unique. For you will note that I have not followed the reasoning from the enormous need for reinforcement contingencies that led B. F. Skinner in 1954 to throw up his hands in despair at a major part of the task of the classroom teacher. I have come to the problem by an acceptance of the need for cognitive validity in teaching, a need of the kind to which the analyses of research workers like Smith and Taba inexorably lead us, and by a confrontation with the unyielding facts of individual differences.

If good teaching makes demands for impossibly complex, subtle, and rapid cognitive feats on the part of the teacher, and if the individual differences among pupils in both stable and momentary cognitive readinesses inevitably force the teacher to miss many of his targets, what can be done? According to this analysis, what we need, for some important kinds of teaching, is some kind of individualized, self-paced, prearranged yet flexible sequences of give-and-take between teacher and pupil. This kind of give-and-take is well known to all of us and occurs in most classrooms. It is likely, as Arno Bellack has reported in his meticulous study of fifteen classrooms, that "the basic verbal interchange in the classroom is the soliciting-responding pattern. Teachers often shape and frame this basic pattern with reacting moves and

occasionally with structuring moves" (Bellack, et al., 1965, p. 11). That is, most of the time teachers ask and pupils answer questions, and then the teachers evaluate the answers; sometimes also the teacher tells the pupils what to think about, or provides background information.

But the trouble is that the teacher's side of the conversation cannot be as cognitively valid and carefully planned as Smith and Taba [and I] would like it to be. And, in any case, even when the teacher is saying the right thing for some of her pupils, she may very well be saying the wrong thing for the rest of them.

Programed Instruction

As you probably have guessed by now, I am leading the argument toward programed instruction. The "individualized, self-paced, prearranged yet flexible sequences of give-and-take between teacher and pupil" to which I referred a few moments ago, are exactly what programed instruction tries to provide. It is little wonder that many thoughtful students of teaching are moving toward programed instruction as a solution to part of the problem of teaching. For example, here is how Gagné took his stand, near the end of his book-length analysis of the conditions of learning: "The major possibilities of predesigning instructional content to allow for individual differences have been exhibited, not in the classroom or in the textbook, but in programmed instruction" (Gagné, 1965, p. 252). Similarly, Harry Broudy, whom we may regard as non-partisan on this issue, holds that "... there is less ground than is commonly assumed to believe that there are kinds of instruction that only a live teacher can provide ... any material that can be symbolized, that has some kind of logical and syntactical structure, can be adapted for machine instruction.... As to strategies of motivation, presentation, eliciting of a trial response, correction of trial responses, practice of

correct responses, inducement of insight into relational patterns and evaluation of any and all responses, there is little doubt that properly programmed machines will not let us down, for this is their strong point ..." (Broudy, 1962, p. 153).

So we see that analyses of teaching as the manipulation of cognitive forces lead to programed instruction just as conditioning theories do. Just how will the issue be resolved between programed and live instruction for many kinds of cognitive learnings? In some quarters, it is held that the programed instruction bubble has already burst, and that schoolmen are now feeling somewhat embarrassed over their brief surrender to the fad. In other quarters, it is held that programed instruction is steadily gaining, that better theory and practice are being developed, that further technological advances through computerization are being made, and that programed instruction's promise of giving teachers surcease from certain grave problems of live teaching will be realized.

The Outlook

However programed instruction goes, there is little question that the role, the task, the behavior, and the education of the human teacher are going to be carefully studied in the years ahead. The national interest in such study has been expressed through firm support for research and development in teaching and learning. Scientific interest in teaching has brought learning theorists and researchers out of the laboratory and into the school. Theory and research on teaching may hold the attention of psychologists in the next decade with the same intensity as learning theory and research have in the past. Conceptions of teaching of the kind we have considered should then give way to the rigorous, productive, and educationally relevant principles and laws that will deserve to be called theories of teaching.

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